The Effect of the Jigsaw Cooperative Learning Model within the Kurikulum Merdeka on Students' Geography Learning Outcomes

Tiara Eka Putri [1], Sugeng Widodo [1*], Rahma Kurnia Sri Utami [1]

[1]Department of Geography Education, Faculty of Teaching, Training and Education, University of Lampung, Bandar Lampung City, Indonesia

E-mail:sugeng.widodo@fkip.unila.ac.id

ARTICLE INFORMATION

ABSTRACT

This study aims to determine the effect of the implementation of the jigsaw cooperative learning model in the Kurikulum Merdeka on the Geography learning outcomes of class XI students of SMAN 16 Bandar Lampung on the Atmospheric Dynamics material. The background of this study is based on the fact that most students have difficulty understanding Geography material because the learning methods used by teachers tend to be conventional, such as one-way lectures, so that student participation and learning motivation are low. The jigsaw cooperative learning model was chosen because it is believed to be able to create a more active, fun, collaborative learning atmosphere, and foster individual responsibility in groups. This study used a quasi-experimental method with a one-group pretest-posttest design. The research sample consisted of 33 class XI IPS 1 students who were selected purposively. The research instruments were cognitive learning outcome tests, student activity observation sheets, and student response questionnaires. The results showed that the implementation of the jigsaw cooperative learning model had a positive effect on students' Geography learning outcomes. The application of jigsaw was able to improve conceptual understanding, participation in group discussions, student activeness, and two-way communication. In addition, students' responses to the jigsaw model were also very positive because they considered it to make learning more interesting, easier to understand, and not boring.

INTRODUCTION

Education is the main foundation in national development because it plays a vital role in developing quality, character-based, and competitive human resources. Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System affirms that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual religious strength, self-control, personality, intelligence, noble character, and the skills needed for themselves, society, nation, and state. Therefore, educational success is not only measured by academic results, but also by students' ability to think critically, collaborate, and adapt to social and technological changes occurring in their environment.

The rapid development of technology and information requires the world of education to continue to innovate in creating learning that is adaptive and relevant to the needs of the times. One of the strategic steps taken by the government is the implementation of the Kurikulum Merdeka, which provides flexibility for educational units and teachers in managing the learning process. The Kurikulum Merdeka emphasizes the concept of student-centered learning, where teachers act as facilitators, helping students construct their own knowledge (Ministry of Education, Culture, Research, and Technology, 2022). Through this curriculum,Learning is expected to encourage students to think critically, creatively, collaboratively and communicatively.

However, the implementation of the Kurikulum Merdeka in the field still faces various challenges, particularly in implementing appropriate learning models. Many teachers still employ conventional methods such as lectures and simple question-and-answer sessions, resulting in passive student learning. Consequently, student conceptual understanding and learning outcomes are suboptimal. This aligns with Dimyati and Mudjiono's (2013) opinion, which states that low learning outcomes can be caused by the use of monotonous learning methods and a lack of active student engagement in the learning process.

To address these issues, a learning model is needed that can create positive interactions among students and encourage their active participation during the learning process. One model relevant to the spirit of the Kurikulum Merdeka is the Jigsaw cooperative learning model. This model was developed by Elliot Aronson in 1978 as a form of cooperative learning that emphasizes collaboration among students in small groups to collectively understand the subject matter.

According to Slavin (2021), the Jigsaw learning model provides students with the opportunity to act as "experts" on a specific subtopic and then teach it to their group mates. This process encourages individual responsibility while strengthening students' communication and social skills. Lie (2010) added that Jigsaw cooperative learning can increase learning motivation because each student has a vital role in their group, encouraging them to understand the material thoroughly and contribute to the group.

The Jigsaw model also aligns with the constructivist theory proposed by Vygotsky (1978), which emphasizes that knowledge is constructed through social interaction and collaborative learning experiences. In cooperative learning, students construct their understanding through discussion, exchange of ideas, and collective reflection, resulting in meaningful learning. Thus, the application of the Jigsaw model not only improves conceptual understanding but also fosters social character traits such as cooperation, responsibility, and tolerance.

In the context of geography learning, the application of the Jigsaw cooperative learning model is highly relevant. Geography is a science that not only focuses on mastering theoretical concepts but also demands spatial analysis skills, data interpretation, and critical thinking skills regarding geospheric phenomena. According to Supriyono (2019), effective geography learning must encourage students to actively observe, research, and analyze geographic phenomena, rather than simply memorizing concepts. Therefore, the use of a learning model that encourages active participation, such as Jigsaw, can help students understand the relationship between humans and their environment more comprehensively.

Learning outcomes, as an indicator of learning success, reflect changes in student behavior that encompass cognitive, affective, and psychomotor aspects. Bloom (1956) grouped learning outcomes into three main domains: knowledge (cognitive), attitudes (affective), and skills (psychomotor). In geography learning, good learning outcomes can be seen from students' ability to understand the concepts of space, location, and interaction, and in linking theory to real-world realities. Several previous studies support the effectiveness of the Jigsaw cooperative learning model in improving student learning outcomes. Research conducted by Wulandari (2021) showed that the use of the Jigsaw model can improve understanding of geographic concepts while fostering collaboration among students. Similarly, research by Hidayat and Lestari (2023) found that implementing the Jigsaw model in the Kurikulum Merdeka can improve learning outcomes and student motivation because it provides ample space for active participation in learning.

Based on the description, it can be concluded that the application of the Jigsaw cooperative

learning model is an appropriate alternative in supporting the successful implementation of the Kurikulum Merdeka, especially in improving geography learning outcomes. Therefore, this study aims to analyze the effect of the Jigsaw cooperative learning model in the implementation of the Kurikulum Merdeka on the geography learning outcomes of grade XI students of SMA Negeri 16 Bandar Lampung. This study is expected to contribute to the development of cooperative learning theory and become a practical reference for teachers in implementing effective, innovative, and student-oriented learning strategies.

METHOD

This study used a quantitative approach with a quasi-experimental design. This approach was chosen because the study aimed to determine the effect of the Jigsaw cooperative learning model in the implementation of the Kurikulum Merdeka on students' geography learning outcomes. The research design used was a Nonequivalent Control Group Design, in which two groups were compared: the experimental group and the control group. The experimental group received treatment in the form of the Jigsaw cooperative learning model, while the control group received learning with a conventional model. Both groups were given a pretest and a posttest to measure changes in learning outcomes after the treatment was given.
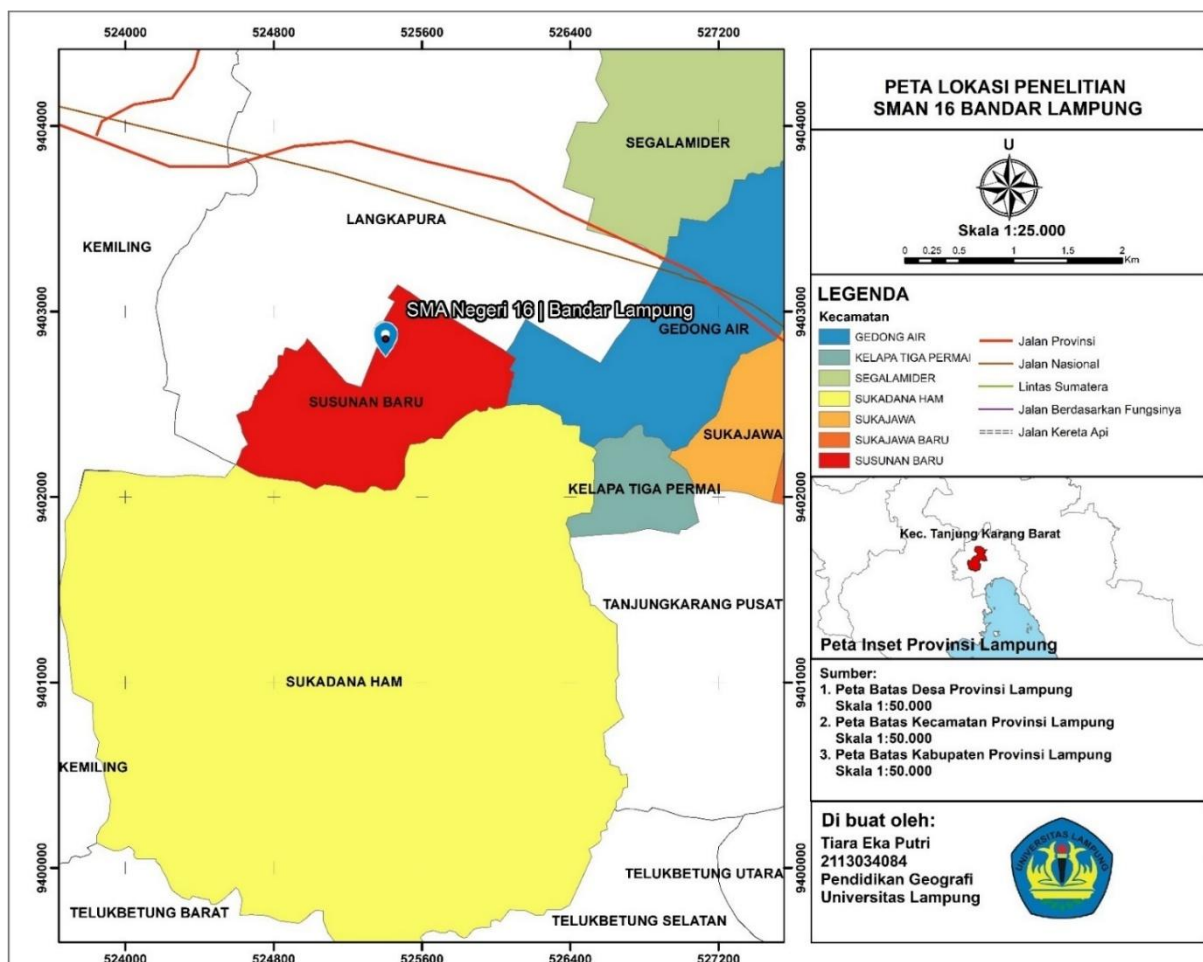

Figure 1. Research Location

This research was conducted at SMA Negeri 16 Bandar Lampung in the even semester of the 2024/2025 academic year. The location was selected purposively, considering that the school has implemented the Kurikulum Merdeka and has relatively homogeneous student characteristics in terms of academic ability. These conditions are considered ideal for conducting experimental research in education because they can minimize the influence of external factors on research results. The population in this study were all 11th grade students of the Social Sciences (IPS) program at SMA Negeri 16 Bandar Lampung. The research sample was selected using a purposive sampling technique, namely selecting samples based on certain considerations relevant to the research objectives. Based on the results of coordination with the geography subject teacher, two classes were selected as research samples. Class XI IPS 1 was designated as the experimental class, while class XI IPS 2 was designated as the control class. The total number of students involved as respondents in this study was 72.

Research data was obtained through three main techniques: tests, observation, and documentation. Tests were used to measure student learning outcomes in the cognitive domain, both before and after the implementation of the Jigsaw learning model. The test instrument consisted of multiple-choice questions structured based on geography learning achievement indicators in the Kurikulum Merdeka. Observations were conducted to observe student activities and the implementation of learning during the teaching and learning process, allowing researchers to determine the level of student engagement and involvement in the learning process. Meanwhile, documentation was used to supplement the research data, such as student name lists, daily grades, and photos of activities during the learning process.

Before being used in the study, the quality of the learning outcome test instrument was first tested through validity, reliability, difficulty level, and discrimination tests using SPSS version 25 software. The test results showed that the test items used had met the criteria of validity and reliability, making them suitable for use as data collection tools in this study. The data obtained were then analyzed using inferential statistical analysis techniques. The first stage was a normality test using the Kolmogorov-Smirnov test to ensure that the data were normally distributed. Next, a homogeneity test was carried out using the Levene test to determine the similarity of variances between groups. After the data was declared normal and homogeneous, a hypothesis test was carried out using the t-test (independent sample t-test) to compare learning outcomes between the experimental and control classes.

The decision-making criteria are determined based on the significance value (Sig.) generated from the statistical test. If the Sig. value is less than 0.05, it can be concluded that there is a significant difference between the learning outcomes of students taught using the Jigsaw cooperative learning model and those taught using the conventional learning model. Thus, this analysis is used to prove the hypothesis that the application of the Jigsaw cooperative learning model in the implementation of the Kurikulum Merdeka has a significant effect on improving students' geography learning outcomes.

RESULTS AND DISCUSSION

This study aims to determine the effect of the Jigsaw cooperative learning model in the implementation of the Kurikulum Merdeka on the geography learning outcomes of grade XI students at SMA Negeri 16 Bandar Lampung. The research data were obtained through learning outcome tests given to two groups: the experimental class taught using the Jigsaw cooperative learning model and the control class taught using the conventional learning model.

Before the treatment was given, both groups were given a pretest to determine the students' initial abilities. Based on the pretest results, the average scores of the experimental class and the control class showed no significant difference, so it can be concluded that the initial abilities of the two groups were relatively balanced. After the learning process with each model was completed, a final test (posttest) was conducted to determine the improvement in learning outcomes. The results of the descriptive analysis showed that the average posttest score in the experimental class experienced a higher increase compared to the control class. Students in the experimental class obtained an average score of 83.65, while the control class obtained an average of 75.40. This difference indicates a

significant increase in learning outcomes after the implementation of the Jigsaw type cooperative learning model.

Table 1. Paired Sample t-Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Standard Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PRETEST - POSTTEST	-34.04000	16.58935	3.31787	-40.88775	-27.19225	-10,260	24	.000

Source: SPSS Calculation Results, 2025

Table 2. N-Gain Test Results

Statistical Description	N	Minimum	Maximum	Mean	Standard Deviation
Ngain_Score	25	-.33	1.00	.7289	.27270
Gain_Percent	25	-33.33	100.00	72.8917	27.27012
Valid N (listwise)	25				

Source: SPSS Calculation Results, 202

The results of the independent t-test indicate that the significance value (Sig. 2-tailed) is 0.000, which is smaller than the significance level of 0.05. This finding demonstrates that there is a statistically significant difference between the learning outcomes of students taught using the Jigsaw cooperative learning model and those taught using conventional methods. The conclusion drawn from this result is that the Jigsaw model has a positive and meaningful impact on improving students' learning outcomes in Geography. These results are consistent with prior research by Wulandari (2021), who emphasized that cooperative learning methods tend to generate higher levels of comprehension and retention among learners compared to traditional teacher-centered instruction.

The observed improvement in the experimental class can be explained by the characteristics of the Jigsaw model, which emphasizes interdependence and shared responsibility among students. In this model, each learner is responsible for mastering and teaching a portion of the material to their group peers, a process that necessitates both accountability and collaboration. This structure creates a community of learning where knowledge is constructed collectively, consistent with Vygotsky's (1978) theory of social constructivism, which asserts that learning is mediated through social interaction and dialogue. Recent studies by Slavin (2021) and Hamid and Alberida (2021) reaffirm that peer teaching encourages active cognitive processing and enhances conceptual understanding, particularly in subjects requiring abstract reasoning like Geography.

Furthermore, the Jigsaw model fosters a learning environment that is participatory and intrinsically motivating. Students become not only receivers of information but also facilitators of understanding within their peer groups. This dual role encourages deeper cognitive engagement, as students must internalize and synthesize the material to teach it effectively. Such active involvement supports long-term retention and promotes higher-order thinking skills, including analysis and evaluation. As noted by Supriyono (2019), learning experiences that require students

to engage cognitively and socially contribute to both academic and affective learning outcomes.

The study also observed that the Jigsaw cooperative learning model effectively transforms passive learning into a dynamic, student-centered process. The findings resonate with Bloom's (1956) taxonomy of educational objectives, particularly in advancing students beyond the comprehension level toward application and synthesis. Students working collaboratively are more likely to question, justify, and apply their knowledge in new contexts, which enhances their critical and creative thinking abilities. Recent literature emphasizes that such dialogic learning models are aligned with 21st-century educational goals emphasizing communication, collaboration, and critical thinking (Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi [Kemendikbudristek], 2022).

During classroom observation, students in the experimental class displayed higher enthusiasm and engagement than those in the control group. They actively exchanged opinions, demonstrated respect for diverse perspectives, and showed responsibility for completing assigned tasks. These behaviors reflect the development of social and emotional competencies, which are crucial components of the Kurikulum Merdeka (Kemdikbudristek, 2022). In contrast, students in the control class were more passive, relying heavily on teacher explanations with minimal participation. The contrast reinforces the notion that cooperative learning models such as Jigsaw can bridge the gap between cognitive achievement and affective growth (Hidayat & Lestari, 2023).

The integration of the Jigsaw model also aligns with the pedagogical vision of the Kurikulum Merdeka, which prioritizes student-centered and competency-based learning. This curriculum encourages teachers to create learning environments that foster autonomy, collaboration, and inquiry. The Jigsaw model operationalizes these principles by positioning students as co-constructors of knowledge, thereby nurturing independence and critical reflection. According to Wulandari (2021) and Lie (2010), when students are actively engaged in explaining content to others, they internalize concepts more effectively and develop stronger interpersonal communication skills.

Quantitative results further reinforce the qualitative observations. The mean score of the experimental group significantly exceeded that of the control group, suggesting that cooperative learning not only improves engagement but also leads to measurable academic gains. This finding is consistent with Slavin's (2021) synthesis of cooperative learning research, which found that structured peer interaction improves both achievement and motivation across diverse educational contexts. Similarly, a recent study by Hidayat and Lestari (2023) demonstrated that Jigsaw-based instruction enhanced students' spatial literacy and understanding of geographic phenomena compared to conventional lecturing methods.

Another notable implication of this study lies in its contribution to developing 21st-century competencies. Geography, as a discipline, requires spatial reasoning, environmental awareness, and problem-solving skills. The collaborative nature of the Jigsaw model trains students to analyze spatial data collectively and interpret geographic relationships critically. Supriyono (2019) argued that interactive learning models enhance not only conceptual understanding but also the ability to apply knowledge in real-world contexts. Thus, the adoption of Jigsaw in Geography education supports the development of holistic competencies aligned with global education frameworks.

Pedagogically, these findings suggest that teachers should consider cooperative learning structures as strategic tools to improve both academic outcomes and student engagement. Beyond mere achievement scores, the Jigsaw model nurtures empathy, communication, and mutual accountability—skills essential for lifelong learning and civic participation. As noted by Dimyati and Mudjiono (2013), effective learning involves cognitive, affective, and psychomotor

dimensions that are best achieved through interactive and reflective methods. Consequently, integrating Jigsaw into Geography education contributes to producing learners who are both knowledgeable and socially competent.

Overall, this research confirms that the Jigsaw cooperative learning model is not merely an instructional alternative but a transformative pedagogical strategy. By engaging students as active participants in knowledge construction, the model strengthens understanding, fosters motivation, and aligns with contemporary curriculum goals. The consistent evidence from this study, supported by prior research and educational theory, underscores the importance of adopting interactive, collaborative learning frameworks to enhance Geography learning outcomes in schools such as Muhammadiyah 2 High School, Bandar Lampung. The Jigsaw model thus stands as an effective approach for cultivating both intellectual and social growth in modern educational settings.

CONCLUSION

Based on the research results and data analysis that have been conducted, it can be concluded that the Jigsaw type of cooperative learning model has a significant effect on students' geography learning outcomes in the implementation of the Kurikulum Merdeka at SMA Negeri 16 Bandar Lampung. The t-test results show a significance value of 0.000 (<0.05), which means there is a significant difference between student learning outcomes in classes using the Jigsaw model and classes using the conventional learning model. Descriptively, the average student learning outcomes in the experimental class are higher than those in the control class. This increase indicates that the application of the Jigsaw model can help students understand geography material more deeply through a collaborative and interactive learning process. The Jigsaw model also encourages each student to play an active role in their group, both as a learner and as a teacher for their group mates, so that the learning process becomes more meaningful.

From the observation results, students who learned with the Jigsaw model appeared more enthusiastic, actively engaged in discussions, and were able to build a sense of responsibility for learning tasks. This activity not only improved learning outcomes in the cognitive domain but also strengthened students' social and communication skills. Thus, the implementation of the Jigsaw cooperative learning model has proven effective in improving the quality of the geography learning process and outcomes in accordance with the student-centered learning principles promoted by the Kurikulum Merdeka. Theoretically, this study reinforces Vygotsky's social constructivism view, which emphasizes that knowledge is acquired through social interaction and collaboration. Practically, the results of this study provide implications that teachers need to be more active in integrating cooperative learning models in geography learning, because this model can increase student interest, participation, and conceptual understanding. Thus, the implementation of the Jigsaw cooperative learning model is worthy of recommendation as an alternative innovative learning strategy relevant to the implementation of the Kurikulum Merdeka, in order to improve the quality of the learning process and student learning outcomes in geography subjects.

BIBLIOGRAPHY

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals*. David McKay Company.

Dimyati, & Mudjiono. (2013). *Belajar dan pembelajaran*. Rineka Cipta.

Hamid, A., & Alberida, H. (2021). Pentingnya mengembangkan e-modul interaktif berbasis flipbook di sekolah menengah atas. *Edukatif: Jurnal Ilmu Pendidikan, 3*(3), 911–918.

https://doi.org/10.31004/edukatif.v3i3.384

Hidayat, A. B., & Lestari, R. (2023). Peran pembelajaran geografi dalam mengembangkan literasi spasial siswa di era digital. *Jurnal Pendidikan Geografi, 11*(2), 87–98. https://doi.org/10.xxxxxx

Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2022). *Panduan implementasi kurikulum merdeka*. Kemendikbudristek.

Lie, A. (2010). *Cooperative learning: Mempraktikkan cooperative learning di ruang-ruang kelas*. Grasindo.

Slavin, R. E. (2021). *Educational psychology: Theory and practice* (13th ed.). Pearson Education.

Supriyono, P. (2019). *Media pembelajaran inovatif dalam pendidikan abad 21*. Deepublish.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wulandari, S. (2021). Student motivation and engagement in digital learning environments. *Jurnal Pendidikan Indonesia, 10*(2), 145–156. https://doi.org/10.xxxxxx